Claims

1. An aqueous solution for use as medium for the specific binding reaction of a binding pair, wherein a first binding member recognises its complementary second binding member, the solution comprising

   a) a buffer to control pH;

   b) a compound A selected from the group consisting of:
   - a compound defined by the general formula I R^1-[[CR^2R^3]$_p$-O]$_q$-R^4, wherein R^1 is hydrogen or hydroxy group, R^2 for each unit independently is hydrogen or hydroxy group, R^3 is hydrogen, methyl group, ethyl group, R^4 is hydrogen or alkyl group, p is an integer of from 2 to 10 and q is an integer of from 1 to 100, with the proviso that the compound at least carries two hydroxy groups;
   - polyol;
   - saccharide;

   c) a non-ionic detergent.

2. The aqueous solution according to claim 1, further comprising a protein in an amount effective to immunologically block non-specific antibody binding.

3. The aqueous solution according to claim 2, wherein the protein is selected from the group bovine serum albumin, ovalbumin, casein, fetal bovine serum.

4. The aqueous solution according to claim 2 or 3, wherein the concentration of the protein is in the range of 0.1 to 2 % (w/v) (preferably in the range of 0.5 to 1.5 % (w/v).

5. The aqueous solution according to any of claims 1 to 4, wherein the solution is comprising a salt selected from the group NaCl, KCl, NH_4Cl.

6. The aqueous solution according to any of claims 1 to 5, wherein the solution is having an ionic strength of 100 mM to 1.5 M, preferably of 200 mM to 1 M, more preferred of 200 mM to 800 mM, further preferred of 200 mM to 600 mM, most preferred of 250 mM to 500 mM.

7. The aqueous solution according to any of claims 1 to 6, wherein the buffer is selected from the group Tris (Tris(hydroxymethyl)-aminomethane, Pipes (Piperazine-1,4-bis-2-ethane sulfonic acid), Mes (4-Morpholino ethane sulfonic acid), Hepes (4-(2-hydroxyethyl)-1-piperazine-ethane sulfonic acid), phosphate buffer.

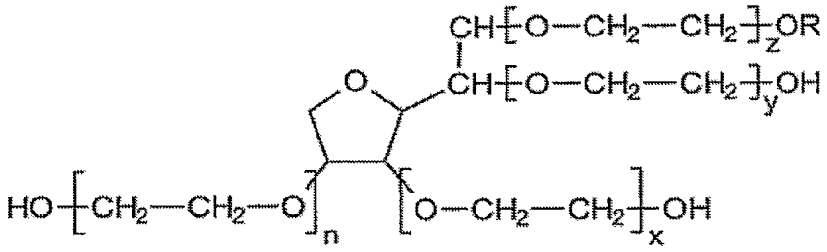
8. The aqueous solution according to any of claims 1 to 7, wherein the compound A is selected from the group polyalkylene glycol, polypropylene glycol, propylene glycol, polyethylene glycol, ethylene glycol, monosaccharides, disaccharides, trisaccharides, saccharose, mannose, trehalose, polyol, glycerol and mixtures thereof.

9. The aqueous solution according to any of claims 1 to 8, wherein the concentration of the compound A is in the range of 0.5 to 25 % (v/v), preferably in the range of 2.0 to 20 % (v/v), more preferred in the range of 2 to 15 % (v/v), further more preferred in the range of 2.0 to 10 % (v/v), even more preferred in the range of 2.0 to 7.0 % (v/v), and most preferred around 5 % (v/v).

10. The aqueous solution according to any of claims 1 to 9, wherein the non-ionic detergent is a compound of the general formula selected from the group.

a) a substituted phenyl residue having substituents R^1 and R^2 (R^1-Ph-R^2), wherein R^1 is C_1-C_9 a alkyl group, and R^2 is a $-O-[CH_2-CH_2-O]_a-H$ group, wherein "a" is an integer of 5 to 40, wherein R^2 in respect to R^1 is in para, meta or ortho position.

b)



wherein n, x, y and z together is an integer of 5 to 40, R is a fatty acid residue.

11. The aqueous solution according to any of claims 1 to 9, wherein the non-ionic detergent is selected from the group Dodecylpoly(ethyleneglycolether)$_m$, wherein m is an integer of 5 to 40; 1-O-n-Octyl-ß-D-glucopyranoside (n-Octylglucoside); Alkylphenolpoly(ethylene-glycolether)$_m$, wherein m is an integer of 5 to 40, preferably m=11 (Nonidet P40®); 1-O-n-Dodecyl-ß-D-glucopyranosyl (1-4)alpha-D-glucopyranoside; Dodecylpoly-(ethyleneglycolether)$_m$, wherein m is an integer of 5 to 40, preferably m = 23 (Brij35®); Poly(oxyethylene)(20)-sorbitane mono fatty acid ester, preferably selected from Poly(oxyethylene)(20)-sorbitane monooleate (Tween®80), Poly(oxyethylene)(20)-sorbitane monolaurate (Tween®20),

Poly(oxyethylene)(20)-sorbitane monopalmitat (Tween®40), Poly(oxyethylene)(20)-sorbitane monostearate); Octylphenolpoly(ethylene-glycolether)$_m$, wherein m is an integer of 5 to 40, preferably m=10 (Triton®X-100).

12. The aqueous solution according to any of claims 1 to 11, wherein the concentration of the non-ionic detergent is in the range of 0.1 to 1.0 % (v/v), preferably in the range of 0.15 to 1.0 % (v/v), more preferred in the range of 0.2 to 1.0 % (v/v), further more preferrred in the range between 0.2 and 0.8 % (v/v), even more preferred in the range of 0.25 % to 0.6 % (v/v), and most preferred about 0.25 % (v/v).

13. The aqueous solution according to any of claims 1 to 12, wherein the ratio of the non-ionic detergent to the compound A is from 1:15 to 1:25, preferably around 1:20.

14. The aqueous solution according to any of claims 1 to 13, wherein the solution does not contain dithiothreitol.

15. The aqueous solution according to any of claims 1 to 14, wherein the pH is adjusted in the range of 5.6 to 9.6, preferably in the range of 6.0 to 9.0, more preferred in the range of 6.5 to 8.0, and most preferred in the range of 6.8 to 7.4.

16. The aqueous solution according to any of claims 1 to 15, having the capability of reducing unspecific binding, cross-reactivity, and disturbing effects of the matrices.

17. The aqueous solution according to any of claims 1 to 16, having the capability of preventing the low-affinity binding with K_D values of up to 10^{-7} M.

18. The aqueous solution according to any of claims 1 to 17, having the capability of preventing the low-affinity binding with K_D values of up to 10^{-7} M and reducing the mid-range affinity binding with K_D values in the range of between 10^{-7} M and 10^{-8} M by at least 90 %.

19. The aqueous solution according to any of claims 1 to 18, having the capability of preventing the low-affinity binding with K_D values of up to 10^{-7} M and reducing the mid-range affinity binding with K_D values in the range of between 10^{-7} and 10^{-9} by at least 90 %.

20. The aqueous solution according to any of claims 1 to 19, having the capability to increase the binding activity (affinity) of antibodies, preferably the binding activity (affinity) of immobilized antibodies.

21. A concentrate of the aqueous solution of any one of claims 1 to 20, preferably a 2 to 10 fold concentrate, more preferred a 3 to 5 fold concentrate.

22. The use of the aqueous solution of any one of claims 1 to 20, as medium for the binding reaction of a binding pair, wherein a first binding member specifically recognizes and binds its complementary second binding member.

23. The use of the aqueous solution of any one of claims 1 to 20, as medium for the antibody-antigen binding reaction.

24. The use of the aqueous solution of any one of claims 1 to 20, as medium for the receptor-ligand binding reaction.

25. The use of the aqueous solution of any one of claims 1 to 20, as dilution buffer for samples and reagents, preferably ligands, receptors, antigens, antibodies or as washing buffer.

26. A method for reducing unspecific binding and/or cross-reactivity and/or disturbing effects of matrices during a specific binding reaction of a binding pair, wherein a first binding member recognises its complementary second binding member, the method comprising the use of the aqueous solution of claims 1 to 20 as medium for the specific binding reaction.

27. A kit for detection by immunoassay of at least one analyte to be tested, wherein the analyte to be tested is a first binding member of a binding pair, wherein the first binding member binds specifically to its complementary binding member, the kit comprising:
    a) a vessel containing a buffer of any one of claims 1 to 20;
    b) a carrier comprising the complementary binding member immobilized thereon to capture the analyte; and
    c) optionally: a reagent which immunologically recognizes the analyte bound to the complementary binding member, wherein the reagent is conjugated to a means of detection; and
    d) optionally: reagents which are reactive with said means of detection to produce a detectable reaction product.